

CLAIMS

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is as follows:

1 1. A cannula system comprising:  
2 a tube having a bore extending along a length thereof;  
3 an assembly connecting to a proximal end of the tube;  
4 an aspirator tip having openings positioned at another end of the tube  
5 remote from the assembly; and  
6 an opening acting as a vent hole positioned along the length of the tube  
7 away from the assembly, the vent hole having a diameter of approximately  
8 between 0.012 and 0.0135 inches and which allows air to flow within the bore  
9 of the tube.

1 2. The cannula system of claim 1, wherein the opening is positioned at  
2 substantially a center of the tube to prevent clogging thereof.

1 3. The cannula system of claim 1, further comprising a plug which extends  
2 within the opening.

1 4. The cannula system of claim 1, wherein the plug introduces air flow into  
2 the tube parallel to a flow of aspirant during suctioning via a plug opening, the  
3 plug opening acting as the vent hole which has the diameter of approximately  
4 between 0.012 and 0.0135 inches and which allows air to flow within the bore  
5 of the tube..

1 5. The cannula system of claim 4, wherein the plug further introduces air flow  
2 directly into the flow of the aspirant during suctioning.

1 6. The cannula system of claim 4, wherein the plug includes:  
2 a cylindrical member having an air passage which leads to the plug  
3 opening;  
4 a collar portion having a closed end which directs air flow into the  
5 plug opening; and  
6 and a bulging portion remote from the collar portion,  
7 wherein when the plug is inserted within the opening of the tube, the  
8 collar acts as a stop by resting on an outer surface of the tube and the  
9 cylindrical member is positioned within the bore of the tube such that the plug  
10 opening is in substantial alignment with the flow of the aspirant during the  
11 suctioning.

1 7. The cannula of claim 6, further comprising a hood with at least one  
2 opening placed over the air passage.

1 8. The cannula system of claim 1, wherein the opening maximizes a mass  
2 flow rate of material having a density of substantially equal to or above 1000  
3 kg/m<sup>3</sup>.

1 9. The cannula system of claim 8, wherein the opening maximizes the mass  
2 flow rate of material having a density of approximately between 1000 kg/m<sup>3</sup>  
3 to 1284 kg/m<sup>3</sup>.

1 10. The cannula system of claim 1, wherein the assembly is one of a hub

2 assembly adapted for use with a reciprocating cannula system and a handle  
3 adapted for use with a manual cannula system.

1 11. A cannula system comprising:  
2 a tube having a bore extending along a length thereof;  
3 an aspirator tip having openings positioned at remote end of the tube  
4 and in fluid communication with the bore;  
5 an opening positioned along the length of the tube; and  
6 a plug positioned with the opening, the plug having an air passageway  
7 in fluid communication with the bore.

1 12. The cannula system of claim 11, wherein the air passageway is in fluid  
2 communication with an opening in the plug

1 13. The cannula system of claim 12, wherein the plug opening has a diameter  
2 of approximately between 0.012 and 0.0135 inches.

1 14. The cannula system of claim 11, wherein the plug introduces air flow into  
2 the tube parallel to and directly into a flow of aspirant during suctioning.

1 15. The cannula system of claim 11, wherein the opening is positioned along  
2 substantially a center of the tube along a length thereof.

1 16. The cannula system of claim 11, further comprising a hub remote from  
2 the opening.

1 17. The cannula system of claim 11, wherein the plug reduces losses caused

2 by air making a right angle turn and turbulently mixing with a flow of aspirant  
3 suctioned through the tube.

1 18. The cannula system of claim 11,  
2 wherein the plug includes:  
3 a cylindrical member having the air passageway and an  
4 opening; and  
5 a collar portion having a closed end which directs air flow into  
6 the opening,  
7 wherein when the plug is inserted within the opening of the tube, the  
8 collar acts as a stop by resting on an outer surface of the tube and the  
9 cylindrical member is positioned within the bore of the tube such that the  
10 opening of the plug is in substantial alignment with the flow of the aspirant  
11 during the suctioning.

1 19. The cannula system of claim 10, wherein the plug includes a hood with at  
2 least one hole placed over the air passage.

1 20. The cannula system of claim 17, wherein the at least one hole has an air  
2 flow capacity at least equal to an air flow capacity of the opening of the plug.

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